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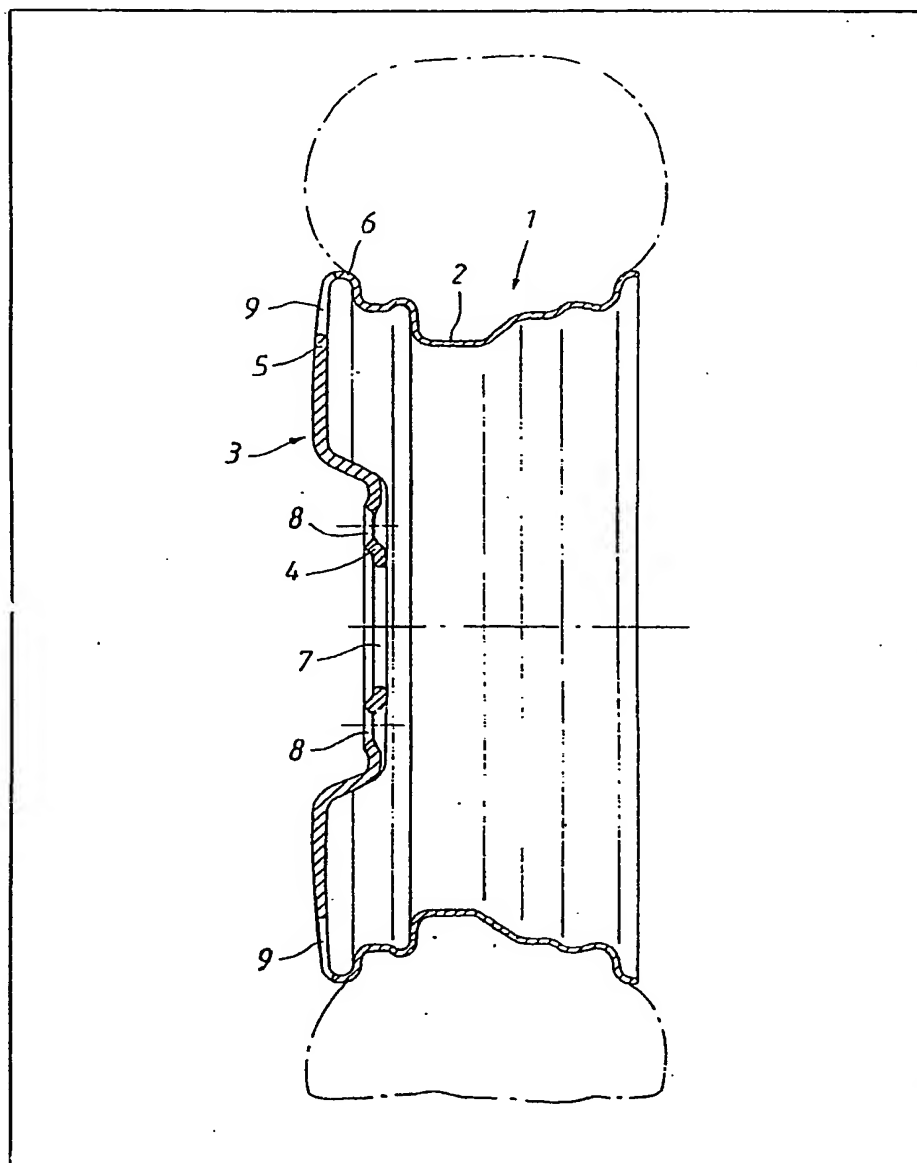
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(54) A disc wheel for pneumatic  
tyres

(57) A disc wheel (1) for pneumatic  
tyres comprises a wheel disc (3)  
connected to the wheel rim (2) at the  
extremity of the outboard rim flange

(6). The central mounting area (4) of  
the disc (3) may be inset from its  
peripheral portion (5), and ventilation  
holes (9) may be provided at the edge  
of the disc. The disc (3) and rim (2)  
may be formed separately and welded  
together, or may be formed in one-  
piece.



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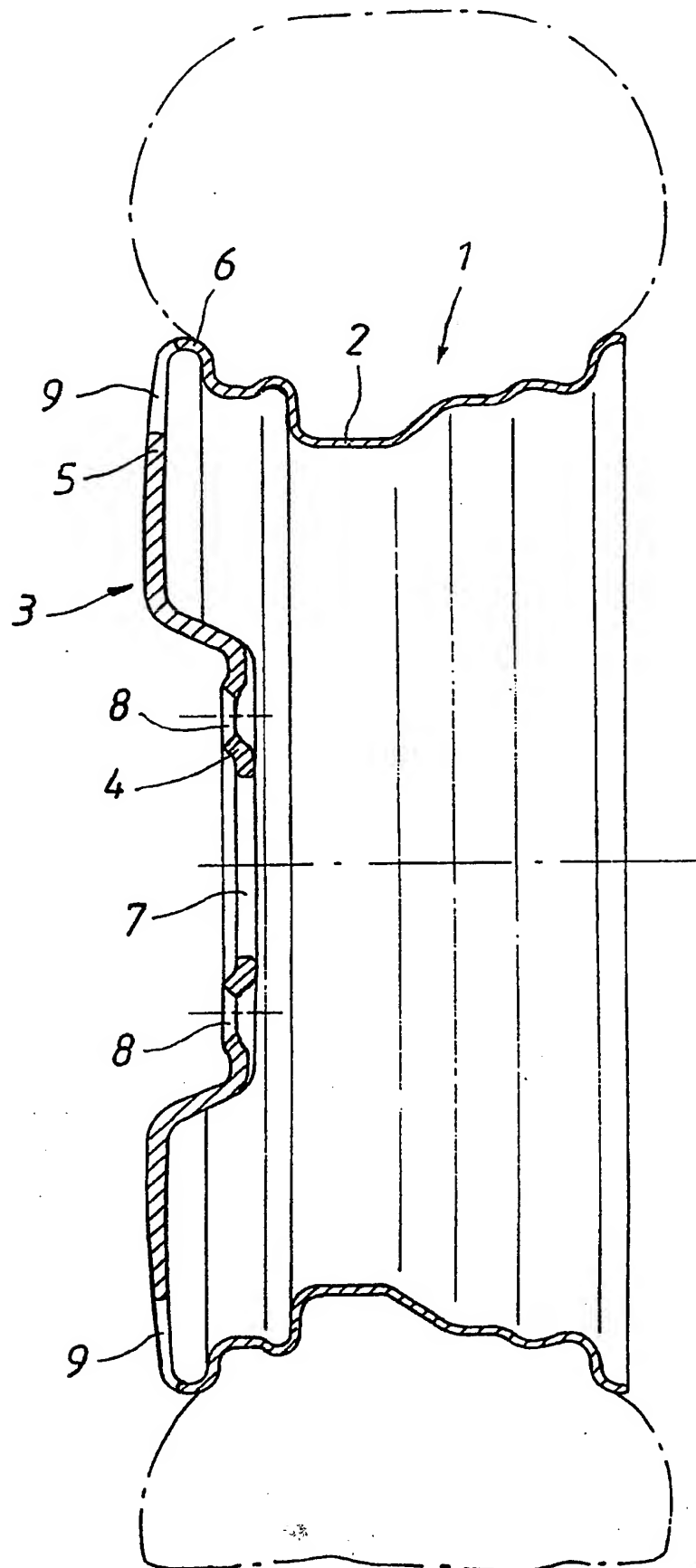


Fig. 2

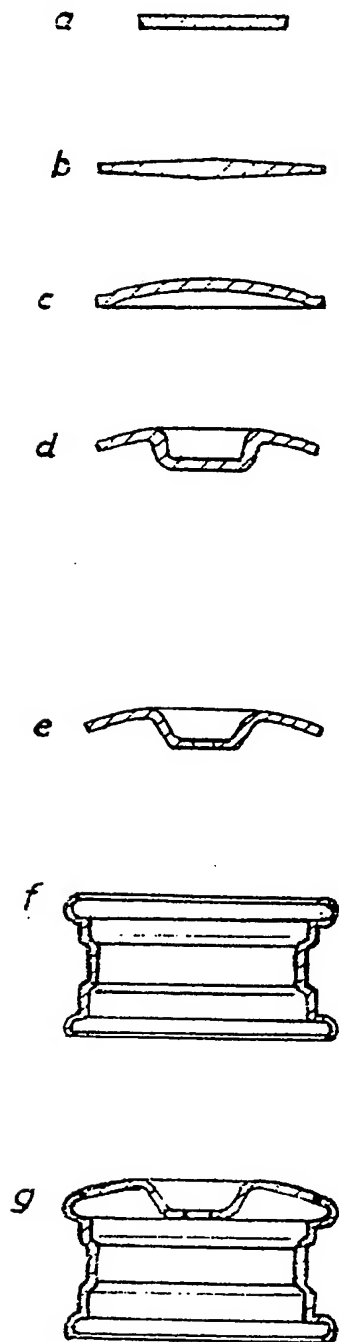
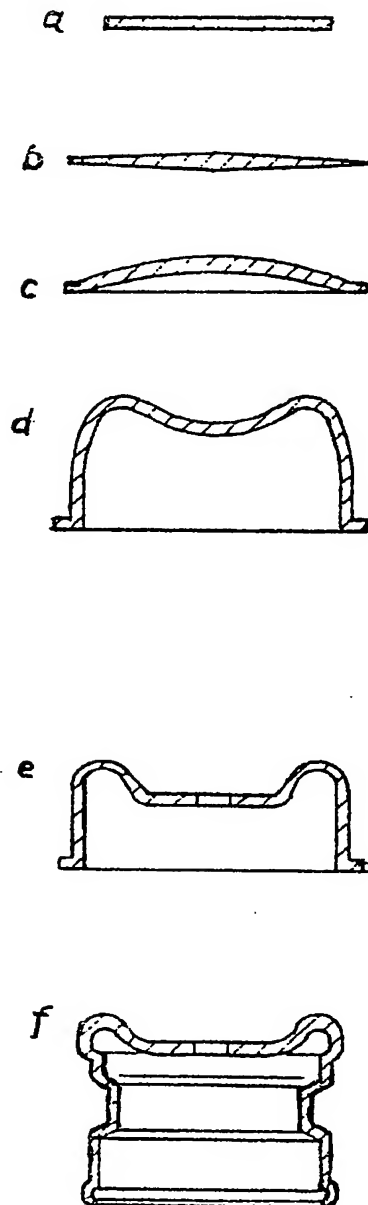


Fig. 3



# SPECIFICATION

## A disc wheel for a pneumatic tyre

The invention relates to a disc wheel for pneumatic tyres, for example for use on vehicles, the disc wheel comprising a rim, which ends in a rim flange at least on the outer side of the wheel, and a disc wheel centre or wheel disc which is connected to the rim and which has a central mounting area and an edge area adjacent thereto which merges on the radially outer side, into the rim flange.

In the case of a known disc wheel of the aforementioned type for example as described in German Auslegeschrift 20 63 379, the central position of the wheel disc extends obliquely outwards from the radially inner wheel mounting area to the rim flange, with stiffening ribs being provided in the area interconnecting the rim well and the wheel disc which runs into the said rim well at an angle. A disc wheel of this type is in practice manufactured only by casting or forging, the overall space which is available for fitting the brake elements being reduced as a result of the introduction of the wheel dish and the stiffening ribs provided.

In contrast, it is the object of the present invention to provide a disc wheel of the type mentioned in such a manner that it can also be fabricated from sheet metal and, in addition, has favourable spatial conditions for the accommodation of the brake elements.

According to the invention, there is provided a disc (as Claim 1). The invention makes it possible for the disc wheel to be simply formed from sheet metal, particularly sheet steel or sheet aluminium, a smooth outer side being formed on the wheel and a large amount of space being provided for the fitting of the brake elements. In addition, it is possible to dispense with special ornamental hub caps, that is without adversely affecting aerodynamic conditions. Moreover, a disc wheel of this type can be simply designed also in one piece. In addition to a one-piece design of this type, an embodiment of the form of a welded structure is also possible in accordance with the invention, that is, given favourable conditions for welding.

In an embodiment of the invention it is found advantageous if the central mounting area is axially recessed back in relation to the edge area of the wheel disc centre since this results in greater rigidity and improved fatigue strength in the particularly highly stressed areas of the disc wheel. In this connection the thickness of the wall of the wheel disc centre can be manufactured so as to be less than that of known embodiments, so as to save material and weight. At the same time the central mounting area is preferably set back in relation to the edge area, but only to such an extent that the wheel mounting elements do not protrude.

In a further embodiment of the invention the wheel disc can have a wall thickness tapering radially outwards from the central mounting area

in order to achieve a uniform stress on the wheel disc.

An embodiment of the invention will now be described in more detail below by copy of an example and with reference to the accompanying drawing, in which:—

Figure 1 is an axial section through a disc wheel and Figures 2 and 3 illustrate two possible methods for its manufacture.

In Figure 1 the disc wheel, which is designated by reference numeral 1, consists of a wheel rim 2 and a wheel disc centre 3 which are connected to one another to form a single unit. The disc wheel centre 3 has a central mounting area 4 and an edge area 5 adjacent thereto which, on the radially outer side, merges into the rim flange, that is in such a manner that the outer and inner contours of the rim flange 6 and wheel disc 3, respectively, are adjacent to one another.

The wheel disc centre 3 is approximately flat in its edge area 5 whilst the mounting area 4 is set to form a recessed position in relation to the edge area 5. The mounting area 4 comprises a wheel centre hole 7 and a plurality of through holes 8 distributed over the circumference of the area, to receive wheel mounting elements (not shown).

The radially outer edge area 5 of the wheel disc is provided with through holes 9 which are distributed over its circumference and which enable better ventilation and cooling of the braking elements and at the same time result in a saving in weight. The wall of the wheel disc is preferably thicker in the mounting area 4 than in the edge area 5.

The mounting and edge areas of the wheel disc can also be both arranged in the same plane which forms the outer side of the disc wheel.

Owing to the fact that the wheel disc is in design largely flat, it is possible to dispense with special ornamental hub caps and, in spite of this, still achieve favourable aerodynamic conditions.

Figures 2 and 3 show in diagrammatic form, two different manufacturing sequences or stages, with Figure 2 illustrating manufacture of the disc wheel in more than one part whereas Figure 3 shows one-piece manufacture of the disc wheel.

In the view shown in Figure 2, relating to the manufacture of the disc wheel in the form of a welded structure, the dish and rim are manufactured separately and welded together in the final stage. The individual stages of the manufacturing process are:

- a) Cutting the circular disc blank to size
- b) Drawing or beating out the circular blank
- c) Pre-drawing the circular blank
- d) Drawing the circular blank
- e) Finish-pressing the circular blank
- f) Making the wheel rim
- g) Welding the rim to the circular blank which has been finish-pressed according to stage e).

At stage f) the weld seam around the circular blank is only indicated diagrammatically, and this weld is preferably turned or ground on the outside in order to obtain a smooth contour.

The manufacture of the rim is by conventional

method and is therefore further described.

One-piece manufacture of a disc wheel is shown in Figure 3. In this case the production sequence is:

- 5 a) Cutting the circular blank to size
- b) Drawing or beating out the circular blank
- c) Pre-drawing the circular blank
- d) Drawing the circular blank
- e) Finish-pressing the circular blank
- 10 f) Rolling the rim.

#### CLAIMS

- 1. A disc wheel for a pneumatic tyre, the disc wheel comprising a rim, which ends in a rim flange at least on the outer side of the wheel, and a disc wheel centre of wheel disc which is connected to the rim and which has a central wheel mounting area and an edge area adjacent thereto which
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merges to its radially outer side, into the rim flange, wherein the edge area of the wheel disc is adjacent, on its radially outside, to the outer edge of the rim flange and the rim flange is extended into a radial plan which forms the outer side of the disc wheel.

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- 2. A disc wheel according to Claim 1, wherein
- 25 the central mounting area is set back in relation to the edge area of the wheel disc.

- 3. A disc wheel according to Claim 1 or Claim 2, wherein the wheel disc has a wall thickness which tapers radially outwards from the central mounting area.
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- 4. A disc wheel for a pneumatic tyre substantially as hereinbefore discussed, with reference to the accompanying drawings.

- 5. A method of manufacturing a disc wheel,
- 35 substantially as hereinbefore described, with reference to the accompanying drawing.